

NOTES ON THE POLYGONACEAE OF SIKKIM¹

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The paper provides notes on species of *Aconogonon* and *Persicaria* in Sikkim. Two new combinations, one under *Aconogonon* and another under *Persicaria*, are proposed.

Aconogonon (Meisn.) Rchb.

The genus is mainly distributed in Asia and North America, and comprises of *c.* 15 species, of which 11 species occur in the Himalayan region. The first record of *Aconogonon* from Sikkim was made by Griffith who collected *A. molle* (D. Don) Hara (as *Polygonum molle* D. Don) and *A. rude* (as *Polygonum rude* Meisn.) in the early 19th century from somewhere in Sikkim and Bhutan. J.D. Hooker collected 4 species, namely *A. campanulatum* (Hook.f.) Hara, *A. molle* (D. Don) Hara, *A. hookeri* (Meisn.) Hara, and *A. polystachyum* (Meisn.) M. Kral (all under *Polygonum*) from different parts of Sikkim during his tour in the area between 1848-49. At present, 7 species have been recorded from Sikkim. Only *A. hookeri* (Meisn.) Hara is restricted to Sikkim, Bhutan and southeast Tibet, all other species are widely distributed in Himalayas. Their altitudinal preferences are from warm temperate to alpine regions of the state. *A. paniculatum* (Bl.) Haraldson sometimes grows as low as 1,300 m, and the most alpine species is *A. hookeri* (Meisn.) Hara, which is found up to 5,000 m.

With 7 out of 11 Himalayan species, Sikkim is relatively rich in *Aconogonon*. This makes an interesting comparison with 5 species and 5 varieties from Nepal (Hara 1982), 4 species from Himachal Pradesh (Chowdhery and Wadhwa 1984) and 5 species and 3 varieties from Bhutan (Grierson and Long 1983).

Study of the available material of *Aconogonon* at BSHC poses the problem of species delimitation. In recognizing species, we have

followed Hara (1982) to a great extent. However, his placement of *Aconogonon polystachyum* (Meisn.) M. Kral under *Persicaria* is being contested here, due to the presence of characters like flowers in branching racemose panicles, campanulate and exserted from bracts, which favour its retention under *Aconogonon*. The treatment of *A. rude* (Meisn.) S.S. Dash & P. Singh as a distinct species is favoured by the characters mentioned in the following key and in Table 1.

KEY TO THE SPECIES OF *ACONOGONON*

- 1a. Plants dwarf, unbranched, only with radical leaves, cauline leaves absent or rarely 1-2
..... *Aconogonon hookeri*
- b. Plants shrubby with much branched stem, radical leaves absent, cauline leaves present 2
- 2a. Perianth spreading, cleft nearly to the base 3
- b. Perianth campanulate, cleft up to 2/3 down ... 6
- 3a. Flowers more than 4 mm across, panicles dichotomously branched, achenes without baccated perianth, enclosed in perianth
..... *A. polystachyum*
- b. Flowers less than 4 mm across, panicles thyriform, achenes with baccated perianth, slightly exserted from perianth 4
- 4a. Plants glabrous, leaves turn black when dry
..... *A. paniculatum*
- b. Plants pubescent or densely hairy, leaves not black when dry 5
- 5a. Plants strigose hairy, nodes with reflexed hairs, venation of perianth reticulate *A. rude*
- b. Plants whitish villous, stem densely appressed hairy with silky white hairs, nodes without deflexed hairs, venation of perianth parallel
..... *A. molle*
- 6a. Leaves ovate-elliptic, acute at apex, 1-3 x 0.8-1.5 cm, sessile or subsessile, inflorescence

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TABLE I
COMPARATIVE MORPHOLOGY OF THE SPECIES OF *ACONOGONON* OF SIKKIM

<i>A. molle</i> (D. Don) Hara	<i>A. paniculatum</i> (Bl.) Haraldson	<i>A. rude</i> (Meisn.) S.S. Dash & P. Singh	<i>A. polystachyum</i> (Meisn.) M. Kral	<i>A. tortuosum</i> (D. Don) Hara	<i>A. campanulatum</i> (Hook.f.) Hara	<i>A. hookeri</i> (Meisn.) Hara
1. Undershubs or shrubs.	Shrubs.	Shrubs.	Shrubs up to 150 cm high.	Shrubs, stems dichotomously branched.	Sub-erect stoliferous herbs with ascending branches.	Dwarf perennial herbs with thick rootstock.
2. Stems striate, appressed densely pubescent or velutinous, nodes with ascending hairs.	Stems striate, glabrous.	Stems striate, glabrous or appressed pubescent, nodes with ring of deflexed hairs.	Stems glabrous or minutely pubescent, but without ring of deflexed hairs at nodes.	Older stems glabrous, younger stems very minutely finely pubescent, sulcate.	Stem minutely pubescent.	Stem silvery pubescent.
3. Leaves lanceolate, 6-12 x 1-3 cm, densely silky hairy beneath, lateral veins 20-30 pairs, petioles up to 1.5 cm long.	Leaves ovate to lanceolate, 4-12 x 1.5-5 cm glabrous on both side, turn black when dry, lateral veins 18-30 pairs, petioles 1-2.5 cm long.	Leaves ovate-lanceolate to lanceolate, up to 17 x 7 cm, appressed pubescent on mid-vein and lateral veins beneath, lateral veins 12-20 pairs, raised on ventral side, petioles up to 1.5 cm long.	Leaves ovate-elliptic, 7-20 x 1.5-8 cm, glabrous on upper surface, very smoothly pubescent on lower surface, lateral veins 12-20 pairs, sub-sessile or petioles up to 1 cm long.	Leaves ovate-elliptic, 1-3 x 0.8-1.5 cm, rounded at base, finely pubescent on both surface sessile or sub-sessile, lateral veins up to 8 pairs.	Leaves elliptic-ovate or lanceolate, 5-12 x 2-5 cm, usually grey tomentose beneath, lateral veins 10-23 pairs, petioles 1-1.5 cm long.	Leaves oblong-oblancoelate, 2.5-6 x 0.6-3 cm, sparsely white sericeous on both surfaces, lateral veins 8 pairs, mostly basal sub-sessile or sessile.
4. Ochrea ca 1 cm long, thick, cupshaped, truncate, densely velutinous.	Ochrea ca 1 cm long, membranous, younger are truncate, older split, glabrous.	Ochrea up to 2.5 cm long, membranous, minutely pubescent.	Ochrea up to 2.5 cm long, tubular membranous, glabrous.	Ochrea 0.7-1.5 cm long, tubular, but cleft at apex, pubescent.	Ochrea 0.7-1.5 cm long, tubular, sometimes truncate, minutely pubescent.	Ochrea 1 cm long, brownish, tubular, glabrous or minutely pubescent.
5. Inflorescence of thyrsiform racemes, rachis ca 13 cm long, densely appressed pubescent, bracts ochroleate, papery.	Inflorescence of lax thyrsiform racemes, rachis up to 14 cm long, glabrous, bracts ovate, acuminate at apex, papery.	Inflorescence of dense thyrsiform racemes, rachis up to 12 cm long, bracts ovate-lanceolate, glabrous.	Inflorescence of lax, dichotomously branched panicles, rachis up to 8 cm long, pubescent, bracts ovate.	Inflorescence of dense terminal panicles, rachis 1-4 cm long, pubescent, bracts ovate-lanceolate.	Inflorescence of axillary and terminal divaricately branched cymes, rachis up to 10 cm long, pubescent, bracts ovate.	Inflorescence of slender solitary branched racemose panicles, rachis 4-10 cm hirsute, bracts minute.

TABLE I (CONTD.)
COMPARATIVE MORPHOLOGY OF THE SPECIES OF *ACONOGONON* OF SIKKIM

<i>A. molle</i> (D. Don) Hara	<i>A. paniculatum</i> (Bl.) Haraldson	<i>A. rude</i> (Meisn.) S.S. Dash & P. Singh	<i>A. polystachyum</i> (Meisn.) M. Kral	<i>A. tortuosum</i> (D. Don) Hara	<i>A. campanulatum</i> (Hook.f.) Hara	<i>A. hookeri</i> (Meisn.) Hara
6. Flowers creamy, perianth 5, ovate-oblong, divided up to base, ca 3 mm long, parallel veined, stamens 8, ovary trigonous, turgid, styles 3.	Flowers white, perianth 5, ovate-oblong, 2 x 1 mm, divided up to base, parallel veined, stamens 8, arises from a basal disc, anthers basifixed.	Flowers brown, perianth 5, broadly ovate-oblong, 2 x 1 mm, reticulately veined, stamens 8, anthers basifixed, ovary trigonous.	Flowers creamy white, perianth 5, unequal, 2+3, outer obovate-oblong, inner obovate-spathulate, ca 4 x 4 mm, parallel veined, stamens 8, anthers dorsifixed, black, ovary trigonous.	Flowers white, perianth 5, obovate, 3.5 x 3 mm parallel veined, stamens 8, filament 1 mm, anthers dorsifixed, ovary trigonous.	Flowers pinkish or pinkish-white, perianth 5, oblong, ca 5 mm, parallel veined, stamens 8, anthers dorsifixed, ovary trigonous.	Flowers deep crimson, or deep brown with yellow tips, perianth 5, ca 2 mm across, parallel veined, stamens 8, imperfect in female flowers, ovary trigonous.
7. Achenes trigonous, always with baccated perianth, exerted from perianth on maturity	Achenes trigonous, with baccated perianth, exerted on maturity, turn black when ripe.	Achenes trigonous, exerted from perianth, with baccated perianth.	Achenes trigonous, brown, shorter than perianth, enclosed or exerted from perianth.	Achenes trigonous, brown, shining, not winged.	Achenes trigonous, pale yellow, slightly winged, exerted from perianth.	Achenes trigonous, exerted from perianth on maturity.

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TABLE 2

COMPARATIVE MORPHOLOGICAL CHARACTERS OF *PERSICARIA BIRMANICA* AND *P. PRAETERMISSA*

<i>Persicaria birmanica</i> (Gage) S.S. Dash & P. Singh	<i>Persicaria praetermissa</i> (Hook.f.) Hara
1. Stems spineless, glabrous or minutely pubescent.	1. Stems with regular rows of hooked spines.
2. Leaves deltoid, 3-6 x 1-3 cm, hastate at base, hastate lobes do not come down to petiole.	2. Leaves linear, 3-8 x 0.7-1.5 cm, hastate at base, hastate lobes come down to petiole.
3. Ochrea glabrous.	3. Ochrea hairy.
4. Inflorescence rachis glabrous.	4. Inflorescence rachis glandular-hairy.
5. Perianth segments 5.	5. Perianth segments 4.
6. Stamens 8.	6. Stamens 5.
7. Ovary trigonous, styles 3.	7. Ovary biconvex, globose, styles 2, branched.

- terminal, 1-4 cm long, perianth 1.5-3 mm across, achenes not winged *A. tortuosum*
- b. Leaves ovate-lanceolate, acuminate at apex, 5-12 x 2-5 cm, distinctly petiolate, inflorescence axillary and terminal, 4-10 cm long, perianth 4-5 mm across, achenes slightly winged 7
- 7a. Leaves fulvous tomentose beneath
..... *A. campanulatum* var. *campanulatum*
- b. Leaves pubescent beneath
..... *A. campanulatum* var. *oblongum*

The taxonomic decision of keeping *A. rude* as a distinct species necessitates the proposal of a new combination as follows:

Aconogonon rude (Meisn.) S.S. Dash & P. Singh comb. nov.

Polygonum rude Meisn. in DC. Prodr. 14(1): 137.1856; Hook.f. Fl. Brit. India 5:49.1886. *Aconogonon molle* (D. Don) Hara var. *rude* (Meisn.) Hara in Fl. E. Him. 68. 1966 (as *Aconogonum*).

Distribution: INDIA: Assam, Sikkim, Nepal, Bhutan, Myanmar, Indo-China, north China.

Persicaria Mill.

Gage (1903) described *Polygonum*

birmanicum Gage based on collection from Myanmar (Burma). Cave in 1915 collected it from Namchi (Sikkim). Stewart (1930) while dealing with Polygonaceae (as Polygoneae) of eastern Asia considered *Polygonum praetermissum* Hook.f. as a variable species and merged *Polygonum birmanicum* Gage under it. However, these two species come within the circumscription of the genus *Persicaria* and can be separated on the basis of the characters shown in Table 2.

It is clear from Table 2 that *Polygonum birmanicum* Gage needs to be given specific status under the genus *Persicaria*. A new combination is proposed here:

Persicaria birmanica (Gage) S.S. Dash & P. Singh comb. nov.

Polygonum birmanicum Gage in Rec. Bot. Surv. India 2: 412. 1903.

Distribution: INDIA: Sikkim, Myanmar

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